

CONTRIBUTION

TO

STATISTICS OF THE SICKNESS AND MORTALITY

WHICH OCCURRED AMONG THE TROOPS EMPLOYED
ON THE EXPEDITION TO THE SCHELDT
IN THE YEAR 1809.

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(*From the Edin. Med. and Surg. Journal, No. 133.*)

1. *Object, progress, and result of the expedition.*—The object of the expedition is thus stated in the instructions from the King, to his “Right Trusty and Right Well-beloved Cousin and Councillor, John Earl of Chatham, Lieutenant-General of the Forces,” who commanded the expedition. “This conjoint expedition has for its object the capture or destruction of the enemies’ ships, either building at Antwerp and Flushing, or afloat in the Scheldt, the destruction of the arsenals and dock-yards at Antwerp, Terneuse, and Flushing, the reduction of the Island of Walcheren, and the rendering if possible the Scheldt no longer navigable for ships of war.” Including the naval branch of the service, the whole armament amounted to about 70,000 men, which was, I believe, the largest expedition that ever left the shores of England.

On the 28th July, the first part of the expedition sailed from the Downs at five o’clock in the morning, and anchored at seven in the same evening, in the Steen Deep, within three leagues of the coast of Walcheren. The remaining portion or left wing of the army came to anchor on the 29th July.

30th July.—Lieutenant-General Sir Eyre Coote, with a division of the army, consisting of from 12,000 to 13,000 men, landed near Fort Haack, in the Island of Walcheren. The small Fort of Ter Veer was invested on the 31st, and the men surrendered during the night. Head-quarters at Grypskercke.

1st August.—Sir Eyre Coote with the troops under his command moved forwards for the investment of Flushing. The same day a landing was made by Lieutenant-General Sir John Hope and the division of the army under his command, near Goes, in South Beveland. Head-quarters Middleburgh.

3d August.—The troops in South Beveland moved towards Fort Bathz. Accident threw this fort easily into our hands. A party of the guards, it is said, consisting of about thirty, strolled from the army, and finding no obstruction proceeded along the dike till they found themselves unexpectedly before it. The Governor (General Bruce) taking them for a detachment from the main force, spiked the guns, destroyed the ammunition, and crossed over to Bergen-op-Zoom with the whole garrison, which consisted of 600 men. General Bruce was punished for misconduct, being degraded by Louis Bonaparte, and declared unworthy to hold any military rank.

6th August.—The construction of a mortar battery before Flushing was commenced.

9th August.—The division of the army under Lieutenant-General Lord Huntley, and the infantry of Lord Rosslyn’s division, were landed on the Island of South Beveland.

13th August.—The bombardment of Flushing commenced. To reduce a town by bombardment instead of a regular siege

is very seldom adopted. Among civilized nations, it has become a principle to spare as much as possible the lives and property of individuals who are not actually engaged in the service of the state against which an army is employed. By wilful destruction of the property and lives of the inhabitants of a fortified town, we greatly aggravate the horrors of war, which it is our duty as far as possible to mitigate.

15th August.—Flushing capitulated. As the artillery had been directed against the most densely inhabited quarters, and as nearly 10,000 rounds of ammunition were expended, the effect was dreadful,—scarcely a house in the town escaped damage, and in many the roofs were forced in, and the interior exposed to the weather. The town was set fire to in several places, and the houses continued burning during the bombardment. The consequence of this mode of attacking the enemy was eventually injurious to ourselves, in as much as the means of comfortably accommodating the troops, and especially the sick, were greatly limited, which is the reason I have here alluded to the military operations in question. In several of the Flushing hospitals, the roofs had been greatly injured by the shells, and the patients therein accommodated were exposed to the weather. To remedy this defect, workmen were sent from England, but, as these men soon became sick, the repairs made but slow progress. It is stated that some of the soldiers were quartered in cold and damp churches, without beds or any other accommodation of that kind, except the covering of a great coat, and a knapsack for a pillow, and that the hospitals were established in warehouses, into which light and air were admitted only through iron grates.—(*Edinburgh Annual Register*, 1809.)

During the siege the King's approbation was signified to Lord Chatham for the promptitude with which he had commenced, and the vigour with which he had conducted his operations, and he was again commended for his perseverance and celerity. General Monnet, who commanded the garrison, was dismissed from the French army with disgrace, for surrendering while he had still 4000 men fit for duty: for it appears that by far the heaviest loss fell upon the burghers, and that the soldiers suffered comparatively little.

20th August.—Sickness began to show itself among the troops in South Beveland. The number of sick this day was 1564.

21st August.—Head quarters were moved to Ter Goes, in South Beveland. Some of the troops in Walcheren embarked and proceeded up the Scheldt towards Fort Bathz.

23d August.—Head quarters were removed to Crabbenyke, within four miles and a half of Fort Bathz. Sickness increased very much within the last twenty-four hours.

24th August.—Head-quarters removed to Bathz, which is the southmost point of South Beveland, and about twenty miles from Antwerp.

26th August.—The sickness continued to increase rapidly. The number of sick amounted to 5000 rank and file.

When the sickness first began to appear it was imputed by the non-medical part of the army more to accidental and temporary causes, than to the climate and soil of the country. Among these alleged causes I may mention the stench proceeding from the half-extinguished fires in the town ; an inundation which had spread widely through the British lines at Flushing ; and the exhalation from the dead bodies of the enemy, which had been laid in heaps, and just covered over with sand, more for the purpose of concealment than of burial. The water also which they drank was said to contain insects, and consequently to occasion sickness and vomiting. This opinion had so much weight in England, that it was deemed expedient to send over water for the garrison, and the requisite quantity was calculated at 500 tons per week. The men themselves, it seems, never complained of the water ; and when the first importation arrived, it appeared to be so little wanted, that Sir Eyre Coote, at the recommendation of the principal medical officer, gave it to the navy.

27th August.—A council of war was held, and after having maturely weighed the important subject referred for their consideration, the members, who were all Lieutenant-Generals, were unanimously of opinion that the undertaking of the siege of Antwerp was impracticable. The ultimate object of the expedition was consequently abandoned.

28th August.—The sickness increased ; some of the general and many of the other officers were seized with fever ; number of men on the sick list was about 4000. The transports with the cavalry were ordered to sail for England.

29th August.—Head-quarters returned to Ter Goes. The force estimated to be left on the Island of Walcheren, which it was proposed to retain possession of, amounted to 16,766 rank and file, and it was resolved to send home the remainder of the troops as soon as the sick were got off, the captured guns embarked, and the batteries dismantled.

31st August.—"Sickness still increased, and, as in every case, the actual numbers brought for embarkation were much greater than stated in the returns given to regulate the appropriation of transports. The additional numbers arising from the continual occurrence of fresh cases of sickness were put on board other ships, which occasioned a deficit of tonnage. In other cases, the sick were embarked with the well, from the want of sufficient means which the extra accommodation for sick required. The

embarrassment had now unfortunately far exceeded what could have been speculated upon even by those who best knew the effects of this unhealthy climate, and it was consequently beyond the means of our hospital establishment, either to furnish attendance or comforts to the extent required. The officers of the medical staff suffered very much from the disease, and deserved the greatest credit for their unremitting attention to their painful duties.”—(*Journal of the Army.*)

1st September.—The number of sick in South Beveland was upwards of 5000; a great number were conveyed in waggons from Ter Goes to the ferry, and crossed into Walcheren.

2d September.—Head-quarters removed to Middleburgh. Operations for the evacuation of South Beveland in progress.

3d September.—The number of sick amounted to 8194.

4th September.—The troops in South Beveland embarked early in the morning, the guns, carriages, stores, &c. being taken off, and the magazines blown up. The evacuation was completed by three o'clock P. M.

7th September.—The transports with the troops ordered to England sailed. The sick of the whole army, including those sent to England, amounted to upwards of 10,948.

10th September.—Sick in Walcheren 7396.

14th September.—Lord Chatham returned to England, and the command devolved upon Sir Eyre Coote.

29th October.—Lieutenant-General Sir George Don assumed the command of the troops in Walcheren.

13th November.—An order for the evacuation of Walcheren was issued. The British government seems to have hesitated much before they resolved upon ordering the troops to be totally withdrawn from Zealand. Lord Liverpool said in his order to destroy the works, that it was now determined to evacuate the Island of Walcheren, unless some new circumstance should occur in the progress of the operation which might render an alteration in this decision expedient.

23d December.—The island was completely evacuated by the army. The demolition of the works and the embarkation of the troops occupied a month.

2. Strength of the Expedition.—The number of troops, including officers employed, seems to have been between 42,000 and 43,000 men, namely,

	<i>Officers.</i>	<i>Soldiers.</i>
Troops of the line, -	1738	37,481
Artillery and Artillery Drivers,	126	3108
	<hr/> 1864	<hr/> 40,589

The naval branch of the expedition consisted of 35 sail of the line, 2 fifty gun ships, 3 of forty-four guns, 18 frigates, 179 transports, and a number of smaller vessels,—the whole armament being estimated to consist of at least 70,000 men.

3. *Medical Staff*.—The medical staff consisted upon the embarkation of the troops of

1 Inspector of Hospitals—Sir John Webb,	18 Staff Surgeons,
3 Deputy Inspectors,	2 Apothecaries,
5 Physicians,	4 Dispensers,
1 Purveyor,	12 Clerks, and
2 Deputy Purveyors,	30 Hospital Mates.

Subsequently the following officers were added,

2 Physicians,	1 Deputy Purveyor, and
4 Staff Surgeons,	8 Hospital Mates.

Sir John Webb was taken ill on the 13th September. The duties of the medical department were administered by Deputy-inspector Burrows, until the arrival of Sir James M'Grigor, who assumed the charge of the department on the 1st October.

On the 28th September the principal officers of the army medical department were directed, by a letter from the Deputy-Secretary at War, to communicate with Dr Borland, Dr Lempriere, and Sir Gilbert Blane, for the purpose of their proceeding to Walcheren, in order to examine into the nature and tendency of the malady prevalent in that island.

These gentlemen transmitted a report to the Secretary at War, bearing date Middleburgh, 10th October 1809, "On the prevailing malady among his Majesty's forces serving in the island of Walcheren." Except two letters from Sir Gilbert Blane to Sir Lucas Pepys, this report is the only official medical account of the disease, as it appeared in Walcheren, that I have seen. Dr Borland and his coadjutors returned to London on the 12th or 13th October.

4. *Topography and Climate of the Province of Zealand*.—About ten or twelve miles below Antwerp the Scheldt divides into two branches, namely, the East and the West Scheldt. Between these branches, or great estuary of the river lie the three islands which constitute the Province of Zealand, viz. South Beveland, Walcheren, and North Beveland. South Beveland is by far the largest of the three islands; its length is 25 miles from east to west, and its greatest breadth is between 8 and 9 miles. A channel of the sea separates Walcheren from South Beveland. Walcheren is 13 miles from east to west, and 9 miles from north to south. There are two considerable towns in this island—Flushing and Middleburgh. Flushing, which

is situated at the mouth of the Scheldt, is 45 or 50 miles from Antwerp. The surface of the islands of Zealand is flat and low, being in some places below the level of the sea at high-water. As the water pereolates through the banks, and accumulates by rains, much care and labour is required to remove it, which is commonly effected by means of sluices and mills. The water is collected in ditches and canals, and conveyed to the points where it can be most conveniently discharged over the banks. Inundations also occasionally occur, and as the water stagnates, the grounds are frequently left covered with slime and mud. The soil is excessively fertile, and produces corn, abundance of fruit, vegetables, and madder.—(*See the prefixed Sketch of the Province of Zealand.*)

5. *Indigenous Inhabitants of Zealand.*—The indigenous inhabitants of Zealand are said to be very liable to endemic fevers during summer and autumn. They have in general a very unhealthy aspect: the skin is sallow or yellowish, and sometimes it pits on pressure; the muscles are soft, yielding, and inelastic; the abdomen is tumid, while the limbs are small; but as we have no accurate statistical report of the ratio of sickness, it is impossible to arrive at any definite conclusion on that subject. The following tables will furnish some particulars of the movement of the inhabitants of this province. I am indebted to Malte Brun for the materials.

Table I. showing the ratio of population in Zealand, and the late Kingdom of the Netherlands, to births, marriages, and deaths, and the number of children to each marriage.

	<i>Rate of increase of population for 5 years—1825.</i>	<i>Number of inhabitants in 1824, for</i>			<i>Ratio of births to marriages in 1824.</i>
		<i>One Birth.</i>	<i>One Marriage.</i>	<i>One Death.</i>	
Zealand,	0.056	20.7	113.7	31.4	5.49
Netherlands,	0.062	27	132.4	43.8	4.90

The statistics of the kingdom of the Netherlands have been adduced for the purpose of showing the relative movement of the population in Zealand and the whole kingdom.

Table II. showing the annual ratio of births, marriages, and deaths per 1000 of the inhabitants of the Province of Zealand.

<i>Annual ratio per 1000 of</i>		
<i>Births.</i>	<i>Marriages.</i>	<i>Deaths.</i>
48.3	8.7	31.8

In 1815 the population of Zealand amounted to 111,108, and in 1825 it had increased to 129,329, consequently the in-

crement for a period of ten years was 16.4 per cent. or 1.6 per cent. per annum. How far the increase of population may have arisen from immigration I have no means of estimating. We are informed by Mr Milne, in his work on Annuities, (Vol. ii. p. 453,) that in the ten years ending with 1810, there died annually in the marshes of

Cambridgeshire	1 person out of	33.64
Essex, . do. do.		39.10
Kent, . do. do.		33.53
Lincolnshire, do. do.		33.76

and that in the parish of Spalding, which is situated in the lowest part of the fens of Lincolnshire, 1 person out of 31.24 died annually between the years 1797 and 1812.

It will thus appear that the ratio of mortality in Zealand is a little higher than it is in the marshy parts of some of the counties in England, and about the same as in Spalding. In the majority of European states, the annual births amount to 1 in 30, consequently we may conclude that the ratio of births in Zealand is unusually high. The rate of mortality in Europe ranges from 1 in 30 to the lowest rate (in England) 1 in 50.

As the mortality in Zealand is 1 in 31.4, this may be considered as a high rate of mortality.

The following comparative statement of the rate of mortality in five different places will show the relative rate which occurs among the population in Zealand.

Table III. Showing the annual rate of mortality out of every 1000 living

in Zealand, . . .	(1 year's observation)	31.8	} British Medical Almanack
Glasgow, . . .	(15 do. do.)	28.	
London, . . .	(18 do. do.)	28.	
Sweden, . . .	(21 do. do.)	28.	
England and Wales, (18 do. do.)		21.	

In England during a recent period the rate of increase of the population has been 16 per cent. every ten years, or 1.6 per cent. per annum, which is said to be twice as great as the average rate of increase in other European countries. Now the average rate of increase in Zealand was found to be 16.4 per cent. in ten years, consequently the increment is as great as in England. Although the rate of mortality in Zealand is high, so is the ratio of marriages, and the ratio of births to marriages, by which means the population seems to increase faster than in some of the European states.

6. *Influence of the climate of Zealand upon strangers.*—The constitutions of the indigenous inhabitants of Zealand may

be considered in some respects as products of the soil and climate of the country in which they live. In marshy countries, the human frame seems to become, after many successive generations, adapted to the climate in such a degree as to render it a distinct variety from the rest of the species. This is obviously the case in Africa, many places of which could not be long habitable to other varieties of the species constituted very differently from that of the negro. The constitution of the indigenous inhabitants being thus modified and suited to the climate of a country, its endemic influences have comparatively little effect upon them. But when persons whose constitutions are formed by influences of a different kind migrate to a country differently circumstanced diseases may be expected to ensue. (*Copland.*)

Dr Wind, who translated into Dutch Dr Lind's Essay on preserving the health of seamen, and who practised medicine in Walcheren for many years, informs us that the Scotch regiment in the Dutch service has been known to bury their whole numbers at Sluys, in Dutch Flanders, in three years. We learn from the report of Dr Borland and his coadjutors, that, upon an examination of the sick returns of the French army for a period of seven years, it was found that at least one-third or 33 per cent. of its force was annually cut off by endemic disease. I may add, that when the English landed in Walcheren, there were only 85 men alive in a Dutch regiment, which at its arrival there three years before was 800 strong. The annual ratio of mortality in this corps must have been about 31 per cent. or rather more than double the mean ratio of mortality which occurs among troops in Jamaica. Napoleon seems to have known pretty well the real nature of the climate of the Delta of the Scheldt, and of its influence upon strangers; for in a letter to the minister at War in regard to the Walcheren expedition, he says, "we are rejoiced to see that the English have packed themselves in the morasses of Zeeland. Let them be only kept in check, and the bad air and fevers peculiar to the country will soon destroy their army." The French, it is said, crowed over the expedition with the force of reason, the bitterness of sarcasm, and the playfulness of ridicule.

7. *Sickness of the Troops.*—I have already stated that endemic fever appeared among the troops on the 19th of August, or about twenty days after they landed. The following facts, which were communicated to Dr Bancroft by Mr Nixon, surgeon to a battalion of the 1st Regiment of Foot Guards, convey a graphic account of the commencement and progress of endemic fever among the men under his care. The bat-

talion in question landed on South Beveland on the 2d of August, the strength being then 872. On the 19th the endemic appeared among the men, and between that date and the 4th September, the day the corps embarked for England, comprehending a period of sixteen days, 359 men were attacked with fever. The battalion was landed at Chatham about the 7th or 8th of September. Many of the men continued to be attacked with endemic fever, so that by the 8th March 1810, only 117 of the original strength had escaped the disease in question. Some of the 117 men were attacked with intermittent fever as late as the middle of the month of June.

The long protracted period during which the pestilential poison remained latent in the constitution constituted a very remarkable feature in the endemial disease of Zealand. In numerous instances the noxious effects of the miasmata did not appear until nearly a year after the troops returned to England, when they became suddenly affected with the specific symptoms of the disease, apparently in consequence of the slight fatigue of a short march. The influence of the remote cause of intermittent fever as it exists at Seringapatam (Mysore,) is often long inoperative or latent, but I believe not in so remarkable a degree as in the climate of the Delta of the Scheldt.

8. *Statistics of Sickness or inefficiency.*—The following table is intended to show not only the absolute amount of the sickness of the army on the 10th October, but also the relative ratio of sickness among different classes of the troops.

Table IV. Showing the strength of the troops in Walcheren on the 10th October, divided into four classes, the number of each class fit for duty, and the number sick, together with the ratio of sick per 1000 of the mean strength.

<i>Class.</i>	<i>Strength.</i>	<i>Fit for duty.</i>	<i>Sick.</i>	<i>Ratio of sick per 1000.</i>
Officers,	718	552	166	231
Sergeants,	770	463	307	398
Drummers,	343	191	152	443
Rank and file,	14,093	5616	8477	601

} 587

To ascertain the relative degrees of sickness which prevail among different classes of individuals exposed to the same atmosphere is a point of some importance, because it affords a guide to a means of prevention. Thus we see by the above table that the ratio of sickness is highest among the rank and file, and that it is considerably lower among the drummers and sergeants, and lowest among the commissioned officers. Sir John Pringle observed a similar circumstance in regard to the officers in Flanders in 1747,—an advantage he attributed with

much probability to "good beds, dry rooms, and better diet." Sergeants and drummers are usually not much exposed to the night air, not being on sentry, which seems to be the period when the pestiferous atmosphere is most influential, and to this cause may perhaps be in a great measure attributed the comparative low ratio of sickness among these two classes. The duties of sergeants and drummers are commonly not so fatiguing as the rank and file, and hence they are in slight eases not so imperiously impelled to report themselves sick as privates.

The mean ratio of sickness among the troops, namely, 587 per 1000, is obviously extremely high, but even this ratio has been greatly exceeded in the same country; for Sir John Pringle informs us, that when four battalions of British troops, which had been employed in Zealand during the year 1747, went into winter quarters, their sick in proportion to the men fit for duty were nearly as four to one, which is equal to 800 per 1000.

9. *Abstract of the monthly returns of the Troops employed in Zealand.*

Table V. Showing the monthly strength of the British army employed in the Islands of Zealand, together with the number of sick and deaths by disease, and the monthly ratio of sickness and mortality per 1000 of the strength, for a period of nearly four months, or from the 28th July till the 24th November 1809. Compiled from materials contained in a paper in the third volume of the Medico-Chirurgical Transactions.

Date 1809.	Strength.		Total strength officers and soldiers.	Sick. Officers and soldiers.	Ratio of sick per 1000, officers & soldiers.	Deaths. Non-commissioned officers & sold.	Monthly ratio of mortal. per 1000 of N. C officers & sold	Com. offi.	
	Non-com-mis. officers & soldiers.	Commis. officers.						Deaths.	Month. ra. of mortality per 1000.
25th August,	41,64	1879	43,521	2701	62	14	0.3		
Septem.	16,931	723	17,654	8829	500	883	52.	29	40.1
October,	11,921	611	12,532	5872	468	760	63.	9	14.7
Novem.,	6,294	452	6,749	1093	162	196	31.	3	6.6

25th August.—During the early part of the month of August, 100 men and 7 officers died from wounds which are not included in the table. It appears by the return of this date that the ratio of sick of all ranks per 1000 was 62. As the sick of the commissioned officers are merged with the sick of the soldiers, I have not been able to state the ratio of each class separately. The ordinary ratio of sickness among soldiers in this country is about 40 per 1000.

In regard to the mortality from disease among the troops, it is extremely small, being only 14, or one in 2974. This circum-

stance may be attributed chiefly to a careful exclusion of infirm individuals from the troops on embarkation, and perhaps partly to the excitement occasioned by the novelties of active service.

On the 20th of August, Mr Webb, Inspector of Hospitals, made his first communication to Mr Keate, the Surgeon-General, upon the subject of the sickness of the army, by stating that from 6 to 8 men on an average of each regiment had been attacked with fever of the simple continued form.

25th September.—The return of this date shows that the ratio of sick of all ranks was 500 per 1000, and that the monthly ratio of mortality among the soldiers was 52 per 1000, and among the commissioned officers, 40.1 per 1000.

25th October.—The return during this military month shows that the ratio of sick of all ranks was 468 per 1000, which is somewhat lower than the return of September, and that the monthly ratio of mortality among the soldiers, was 63 per 1000, and among the officers, 14.7 per 1000.

25th November.—The ratio of sickness of all ranks this month is 162 per 1000, the monthly ratio of mortality among the soldiers is 31 per 1000, and among the officers, 6.6 per 1000.

The preceding monthly returns are purely military, and consequently they are imperfect, as means of communicating the medical statistics of the army. They give no account of the number taken ill during the intermediate periods, nor of those discharged from hospital, from whatever cause, whether on account of recovery, or for the purpose of being transferred to England. The return of the 25th November shows that the ratio of sick in hospital is considerably lower than that of October, but it is not obvious how this circumstance happened, whether it was occasioned by a reduction of the ratio of admissions into hospital, or from a transfer of the sick to England.

It may, however, be inferred that some abatement of the poisonous influence of the climate took place during the month of November.

10. *Transfer of Sick.*—It has been stated that the total number of sick conveyed from the Scheldt to England amounted to 12,863. The sick so transferred were accommodated as they arrived, either in regimental or general hospitals at Plymouth, Portsmouth, Deal, Harwich, Ipswich, Colchester, Norwich, and Yarmouth.

Return of the sick and convalescents which embarked from the Island of Walcheren, from the 14th September till the 31st October 1809.

<i>Date of embarkation.</i>	<i>No. of men embarked.</i>	<i>Date of embarkation.</i>	<i>No of men embarked.</i>
14th September	115	13th October,	862
15th do.	75	21st do.	397
17th do.	357	22d do.	997
18th do.	309	28th do.	171
29th do.	335	30th do.	705
29th do.	65	31st do.	781
5th October,	623	31st do.	150
6th do.	350		
			6,292

The last shipment of sick took place about the 26th November.

General Monnet, who had commanded the French troops during the seven years they occupied Zealand, recommended to his government never to remove the sick, it being, according to his allegation, found that a greater number of those who were kept on the Island of Walcheren recovered, than of those who were removed elsewhere, so that it appeared as if a salubrious atmosphere acted in his estimation, like a poison upon the system in which the morbid action was confirmed. Fortunately his recommendation was disregarded by the medical and military authorities of the British army.

11. *General view of the mortality of the troops.*

Table VI. Showing the strength of the army (artillery excepted) which embarked for service in the Scheldt, in the month of July 1809, the number of deaths which took place between the period of embarkation and the 10th January 1810, together with the ratio of deaths per 1000 of the strength.

	<i>Class.</i>	<i>Strength.</i>	<i>Killed.</i>	<i>Died from disease on service.</i>	<i>Died since sent home.</i>	<i>Total deaths.</i>	<i>Ratio of deaths per 1000 of strength.</i>
Division of the army which ar- rived in Eng. on 7th or 8th of September.	Officers,	917	1	7	10	18	19
	Non-com. officers.	1455		16	63	79	54
	Soldiers.	19522	9	243	1176	1428	73
Troops assigned for the defence of Walcheren in the beginning of September.	Officers.	901	6	33	10	49	54
	Non-com. officers.	1310	7	128	50	185	141
	Soldiers.	16574	83	1665	606	2354	142

This table shows not only the absolute mortality which took place among the troops within a certain period, but it also shows the relative mortality which occurred in the two divisions or portions of the army, and in three different classes of individuals composing the army. Thus we learn that the ratio of mortality among the soldiers composing that portion of the army which

left Zealand on the 7th September was 72 per 1000, while it was 142 in the army assigned for the defence of Waleheren.

The following table will show the total mortality which took place among the troops employed in Zealand; as also the relative mortality which occurred among the troops of the line and the artillery.

Table VII. Showing the strength of the army, including the artillery which embarked for service in the Scheldt in July 1809, the number of deaths which occurred among the officers and men from the 28th July 1809, till the 1st February 1810, being a period of about six months, together with the ratio of deaths per 1000 of the strength.

<i>Class.</i>		<i>Strength.</i>	<i>Died.</i>	<i>Ratio of deaths per 1000.</i>	<i>Ratio of deaths per cent.</i>
Troops of the line.	{ Officers,	1738	67	38.6	3.86
	{ Soldiers,	37481	3999	106.	10.6
Artillery.	{ Officers,	126	3	24	2.4
	{ Soldiers,	3108	213	67	6.7
Mean of both arms.	{ Officers.	1864	70	37	3.7
	{ Soldiers,	40589	4212	103	10.3

Thus we find that the ratio of mortality among the officers of the troops of the line was nearly 3.9 per cent., while it was 2.4 per cent. among the officers of the artillery. Among the soldiers of the troops of the line, the mortality was 10.6, and among the men of the artillery 6.7 per cent. The mean ratio of mortality among the officers and men of both arms from the date of embarkation to the 1st February, was among the former class 3.7 per cent., and among the latter class 10.3 per cent.

Without intending to institute a comparison between the mortality which occurred among the troops employed on the Scheldt, and that which has been found to occur among troops employed at home and in some of the dependencies and colonies of the United Kingdom, I may, however, submit a statement of the mortality of the troops in a few of these stations, for the information of readers who have not devoted much attention to military statistics.

Table VIII. Showing the annual ratio of deaths per 1000 of the mean strength of the troops employed in the following commands.

<i>Station.</i>		<i>Period of observation.</i>	<i>Ratio per 1000.</i>	<i>Ratio per 100.</i>
Ireland,	-	32 years, from 1797 to 1828,	15	1.5
Bengal,	-	9 years, from 1816 to 1824,	55	5.5
Madras,	-	do. do.	56	5.6
Bombay,	.	do. do.	43	4.3
Windward & Leeward Island command.	{	19 years, from 1810 to 1828,	113	11.3
Jamaica,		do. do.	155	15.5

None of the numerical materials to which I have had access give any account of the health and mortality of the troops after the 1st February 1810, consequently the preceding tables and observations do not refer to circumstances which occurred posterior to that date.

The following passages, respecting the sickness and mortality of the troops which had served in Zealand, I have extracted from the 17th volume of the Edinburgh Review, relate to a more extended period. "Between the 1st January and that of 1st June 1810, there were admitted into the hospitals from the corps which served in Walcheren 36,000 patients. This statement was laid before the Lords in an official return from the military hospitals."—"From facts extracted from the evidence laid before the Houses of Parliament, it appears that 2000 men died, and 10,000 caught the infection during these months, in which the ministry were debating whether or not Walcheren should be retained, and that the whole loss in lives from the expedition may be put at about 8000, and in money between two and three millions." The author of the Historical Abstract of the Transactions of 1809, in the Annual Register, asserts that the expedition cost the country twenty millions Sterling, and imposed a burden of one million of annual taxes.

The following table is intended to give a condensed view of the extent of sickness among the troops which had been employed in Zealand, as it existed on the 1st February 1810.

Table IX. Showing the aggregate strength of the corps which returned to England from the Scheldt, the number of sick on the 1st February 1810, and the ratio of sick per 1000 of the strength.

<i>Class.</i>	<i>Strength.</i>	<i>Sick.</i>	<i>Ratio of sick per 1000.</i>	<i>Aver. ratio of sickness among troops in this country.</i>	<i>No of sick per 1000 over the usual ratio.</i>
Troops of the line. { Officers,	1671	217	129	40	298
{ Soldiers,	33373	11296	338		
Artillery. { Officers,	123	4	32	40	72
{ Soldiers,	2893	324	112		

We learn by this table that the officers of the line suffered much more from the pestiferous climate of Zealand than the officers of the artillery, there being four times more sick per 1000 among the former than among the latter class of officers.

The difference in regard to the ratio of sickness among the soldiers is still greater than among the officers. Among the troops of the line the ratio of sickness is about eight times, and among the artillery nearly three times that which is usual among troops in this country.

It appears by the above table that one-third of the troops of the line were on the sick-list six weeks after Walcheren was evacuated, and we may infer that of the number of cases in hospital, a large ratio would terminate fatally. But long after this date many of the men who had apparently escaped the obnoxious influence of the climate of Walcheren were attacked, and suffered severely from the specific endemic disease, so that a very extended investigation would be required before a near approximation could be made of the consequences of the expedition to the Scheldt, in destroying the efficiency, and promoting the mortality of the British army.

It is well known that among the regiments who had been employed in Walcheren, and who served afterwards in the Peninsula, many of the men were, upon the first exposure to cold and fatigue, rendered unfit for duty, so as frequently not to leave one-third of the strength fit for service. A similar result may frequently, if not generally, be expected in all cases where troops have suffered severely from endemic fever, which commonly leaves less or more of organic disease, by which means recovery and restoration to health is often only partial and temporary.

12. *Relative mortality of different corps and regiments employed in Zealand.*

It will be observed that the following table embraces a space of time extending to 23 weeks, 4 days, and that the period the troops were on shore in Zealand was on an average about 31 or 32 days. By the table we learn also that the mean mortality of the whole corps during the 23 weeks 4 days, was 72 per 1000, and it likewise shows us that there is a great diversity of the ratio of mortality in different corps.

The ratio of mortality among the cavalry is in general low, and from an obvious cause: Except two troops of the 2d German Light Dragoons, none of the cavalry of this division of the army were landed. The transports in which they embarked were sometime in the West Scheldt, and they had reached as high as Fort Bathz, but as they did not land, they were less exposed than the infantry to marsh effluvia.

Table X. Showing the strength of the corps composing a portion of the army which embarked for service in the Scheldt on the 28th July 1809, and which returned to England about the 7th or 8th of September, together with the number who was killed or died on service, as also those who died in England previously to the 10th January 1810, and the ratio of deaths per 1000 of each corps.

Regiments.	Embarked for service.		Killed.		Died on service.		Died since being sent home.		Tot. mort. between 10th Jan. & embark. & home.		Ratio of mort. per 1000 of non-com. officers & soldiers.
	Officers.	Non-com. officers & soldiers.	Officers.	Non-com. officers & soldiers.	Officers.	Non-com. officers & soldiers.	Officers.	Non-com. officers & soldiers.	Officers.	Non-com. officers & soldiers.	
2d Dr.Gds. 6 troops.	22	523				1		1		2	4
3d Dr. Gds. 6 troops	22	550						1		1	2
12th Lt. Drs. 6 troops	24	563				2		1		3	5
2d German Lt. Dgs.	33	629				1		12		13	20
1st Foot Gds. 1 Bat.	54	1409			1	16	2	92	3	108	76
do. 3 Bat.	37	1165				5		116		121	104
2d do. 2 Fl. Co	9	259						9		9	54
3d do. 2 do.	9	258				8		22		30	116
4th Foot 1st Bat.	58	1056				3		140		143	135
4th do. 2d Bat.	39	983				7	1	61	1	68	69
8th do. 2d Bat. 2 Co.	8	210						17		17	81
9th do. 1 Bat.	44	1020				2		67		69	67
11th do. 2 Bat.	45	906			2	4		25	2	29	32
14th do. 2 Bat.	41	876	1	2		6		17	1	25	28
20th do.	49	916				3	1	81	1	84	91
28th do. 1st Bat.	30	689				4		52		56	81
42d do. 1st Bat.	39	822				6		89		95	115
43d do. 2d Bat.	36	665						80		80	120
51st do.	34	679		1	3	6		38	3	45	66
52d do. 2d Bat.	29	470				5		29		34	72
59th do. 2 Bat.	42	863				3		5		8	5
63d do. 2 Bat. 2 Co.	22	421				16	3	29	3	45	107
79th do. 1st Bat.	39	1052					1	11	1	11	10
82d do. 1st Bat.	36	1035		4		39		46		89	86
92d do. 1st Bat.	42	1041				19	1	65	1	84	81
95th do. 2 Bat.	50	1058		2		1		133		136	119
Embodied Detach.	44	851			1	102	1		2	102	120
	917	20977	1	9	7	259	10	1239	18	1507	72

The minimum ratio among the infantry is 5 per 1000 (59th Regiment,) which is about a 14th part of the mean, and the maximum is 135 per 1000, (4th Foot, 1st Battalion,) or nearly double that of the mean.

To what causes should we attribute the great difference in the ratio of mortality which took place in different regiments? The men which compose the different corps of the British army are similar in age, in constitution, and in habits of life, their food, exercise, and accommodation in this country are also similar. Did any material difference take place among the different corps in these respects in Zealand, so as in some measure to account for the difference in the ratio of mortality?

Table XI. Showing the strength of the corps composing a portion of the army which embarked for service in the Scheldt, on the 28th of July 1809, and which were assigned for the defence of the Island of Walcheren on the 4th September,

together with the numbers who were killed or died on service, as also those who died in England previously to the 10th January 1810, and the ratio of deaths per 1000 of each corps.

Regiments.	Embarked for service.		Killed.		Died on service.		Died since being sent home.		Tot. Mort. between embark. & 10th Jan.		Ratio of mort. per 1000 of non-com. officers & soldiers.
	Officers.	Non-com. officers & soldiers.	Officers.	Non-com. officers & soldiers.	Officers.	Non-com. officers & soldiers.	Officers.	Non-com. officers & soldiers.	Officers.	Non-com. officers & soldiers.	
9th Lt. Drs. Detach.	22	467				74		23		97	207
Waggon train do.	21	408			1	10		2	1	12	29
1st Foot 3d Bat.	51	1027	1	15	1	62		20	2	97	94
2d do.	40	888		1		67		22		90	101
5th do. 1st Bat.	44	1091	1	14	3	79	2	27	6	120	110
6th do. 1st Bat.	46	1040				175		72		247	237
23d do. 2d Bat.	22	434				109		74		183	421
26th do. 1st Bat.	45	727		2	4	100	1	8	5	110	151
32d do. 1st Bat.	37	625		6		36		10		52	83
35th do. 2d Bat.	34	797	1	5	1	46	1	37	3	88	110
36th do. 1st Bat.	48	765		4	4	115		48	4	167	218
38th do. 1st Bat.	39	873			3	130		28	3	158	181
50th do. 1st Bat.	46	927				69		22		91	98
68th do.	43	849		17	5	103		40	5	160	188
71st do. 1st Bat.	42	1024	2	8	1	57	2	9	5	74	72
76th do.	48	798		3	1	57		34	1	94	117
77th do.	33	599			4	54		8	4	62	103
81st do. 2d Bat.	39	716		3		153		58		214	297
84th do. 2d Bat.	44	840		2		58	1	40	1	100	119
85th do.	46	630		3	3	62	1	34	4	99	157
91st do. 1st Bat.	41	695		0	1	82	1	25	2	107	153
Staff Corp Detach.	6	138				9		4		13	94
1st German Lt. Bat.	32	811		4		37		7		48	59
2d do. do.	32	715	1	3	1	49	1	4	3	56	78
	901	17884	6	90	33	1793	10	656	49	2539	142

This table, like the preceding, embraces a space of time extending to twenty-three weeks four days; but as the troops were assigned for the defence of Walcheren, it is presumed those men who were not transferred sick remained on the island until the 23d December, when Walcheren was evacuated, which comprehends a period of twenty-one weeks. From the great number of sick transferred from Walcheren it may be inferred, that a very small number only of this portion of the army served in Zealand until the 23d December, or for the whole twenty-one weeks. The original force assigned for the defence of Walcheren amounted to from 17 to 18,000 officers and men, which number had been reduced to 6749 by the 25th November.

The mean mortality of this branch of the army is 142 per 1000, or about double that of the mortality of the division of the army which embarked for England on the 4th September.

The difference of the ratio of the mortality among the different corps of this division of the army is not so remarkable as in the other. If we set aside the Waggon Train Detachment, we shall find that the minimum is 59 per 1000, (1st German Light Battalion,) which is considerably less than one-third of the mean, and the maximum 421, (2d Battalion 23d Regiment,) which is about three times that of the mean.

The 9th Light Dragoons, 6th, 23d, 36th, and 81st Regiments seem to have suffered severely,—indeed, considerably more than many of the other corps. I may here repeat the question, what can have been the causes why some corps on the same service, and exposed to the same climate, suffered so much more than others did?

13. *Intensity of Disease or proportion of Deaths to the number treated.*—The only information I have been able to collect on this subject is contained in the following extract, from a work on the Pestilential Disorders of Andalusia, &c. by Sir James Fellows.

Table XII. Showing the number of cases of disease admitted from corps employed in the Scheldt into the General and Regimental Hospitals in the eastern district, the number of deaths to the 1st February, and the ratio of deaths to the number of admissions.

<i>General Hospitals.</i>		<i>Admitted.</i>	<i>Died.</i>	<i>Ratio of Deaths to Sick.</i>
1st class or worst cases	{ Harwich	- 1410	269	1 in 5
	{ Yarmouth	- 457	58	1 8 nearly
2d class.	{ Ipswich	- 2437	188	1 12½
	{ Norwich	- 101	10	1 10
3d class.	{ Colchester	- 1441	37	1 39
	{ Woodbridge	- 859	41	1 21
		<hr/> 6705	<hr/> 603	<hr/> 1 11
Regimental Hospitals,		- 10831	311	1 35
		<hr/> 17536	<hr/> 914	<hr/> 1 19

The number of admissions include relapses and patients transferred from the different hospitals.

On the 1st February the number of patients in the various hospitals in the eastern district amounted to 2327.

14. *Desiderata.*—In the month of July 1810, Dr James Clark of Nottingham pointed out the great national advantage which might result if the medical officers who were employed with the troops in Zealand would present the public with information on the following interesting points of inquiry, (Edinburgh Medical Journal, Vol. vi.)

“1st. Topographical accounts of the different situations which the troops occupied in Zealand, and in what manner they were accommodated.

“2d. History of the disease at each of these stations, arranged as much as possible upon a similar plan, to afford a facility of comparison.

“3d. The causes producing the disease, whether referable to one or many combined, whether the body was predisposed by previous hardships, or by irregularities of diet, want of clothing, &c.

“4th. Did one station induce the intermittent, and another the remittent?

“5th. What methods of treatment were pursued at each station, the result attending each, and the general result of the whole?

“6th. What prophylactic measures were adopted?”

Hitherto, so far as I know, Dr Clark's call has not been responded to, although there must have been from 240 to 250 medical officers employed in Zealand; but it is hoped a comprehensive account of the health concerns of the expedition may yet appear.

In addition to Dr Clark's scheme, I would suggest that a numerical or statistical history of the armament should be compiled. It is presumed that there is abundance of materials for that purpose in the public offices. A comprehensive statistical enumeration of the actual state of the health of an army, and the extent to which it is deteriorated under different circumstances, is a highly important element for the acquisition of both political and professional knowledge. It seems therefore to be the incumbent duty of government, to make a proper use of the military statistical materials which have been collected, and which are daily accumulating, so as to draw from the calamities of war, or the wide spreading pestilence of unhealthy colonies, or stations, some benefit to mankind in general, and to the army in particular. Such a measure would have a beneficial influence in showing the connection between diseases and their natural causes, and eventually it would contribute greatly to direct us to the best means of promoting the welfare, improving the efficiency, and preserving the health of soldiers.

The preceding tables are submitted to the medical profession simply as statistical facts,—materials for thinking. It did not come within the writer's plan to deduce the important pathological and practical conclusions which they are obviously calculated to excite. He is well aware that his data were limited and defective; but as he had access to no better, it has been his wish to make the best use he could of those he had in his possession;

and if his paper should serve as a specimen of what may be done in this way, and excite others who have better opportunities for prosecuting military medical statistical investigations than he has, to improve their opportunities, his object will be effectually gained.

It may not be generally known to the readers of this Journal that the compilation of the statistics of the British army, at home and abroad, for a period of about twenty years, has been for some time in progress. In the month of October 1835, the author of this contribution, and Lieutenant Tulloch, 45th Regiment, who had previously been engaged in statistical pursuits, were appointed to examine the public documents in the Record-room of the Medical Department, and in the War Office, for the purpose of ascertaining the extent of the sickness and mortality of the troops, together with the prevailing diseases among the men in each military command. The statistics of the troops in the following commands are nearly ready, namely, Jamaica, Windward and Leeward Islands, West Coast of Africa, Cape of Good Hope, Mauritius, Malta, and Gibraltar. Lord Howick, the Secretary of War, has with great liberality sanctioned the publication of the reports already finished, so that by the beginning of the year 1838 a part of the work may be before the public.

The topography and statistics of the different colonies and dependencies to which troops are sent should form part of the education and study of every military man, whatever be his rank and duties. This branch of information obviously comprehends the elements of the condition of a country, natural and artificial, particularly physical geography, climate, soil, &c. &c., together with an account of the health of the indigenous inhabitants, and of the troops employed in a settlement, &c. In the military service, the ravages made by malaria have been dreadful, and in some commands and localities the loss of human life is still great. Sometimes these effects may have been inevitable, while on other occasions they seem to have been the result of neglect, inattention, or ignorance, which could not always be easily excused. We dread, and justly dread, the influence of epidemics, such as the plague and cholera, while we submit with an apparent indifference to the perennial consequences of malaria in unhealthy localities, without always duly inquiring whether the remote cause of a high ratio of sickness and mortality among troops might not be obviated. We endure what is expected; but when it is once shown that great sickness is not fated or unavoidable, much may commonly be done to prevent it. Never perhaps did ignorance lead to such

grievous and humiliating results as have followed inattention to the means of preserving the health of armies. When the French army attempted to take possession of Naples in 1528, they were reduced within a few days from 28,000 to 4000, in consequence of choosing an injudicious encampment at Baiæ. A talented writer in an article on military education, inserted in the *Edinburgh Review*, (Vol. xlix. page 113,) expresses himself strongly in regard to the expedition to the Scheldt. His words are, “ *The expedition to Walcheren, planned and conducted as it was, was the fruit of statistical ignorance in every one,—everywhere from the prime minister to the commander-in-chief, and from him to the surgeon’s mate. That ignorance which every Middleburghian, any Dutchman could have enlightened or dispelled, cost us ten thousand brave men, not a little money, and not a little credit, and not a few tears and inconveniences to those whom statesmen never consider.*”

Edinburgh, September 1837.

SKETCH
OF THE
PROVINCE
OF
ZEALAND.



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